



METAL INDUSTRY INDICATORS



December 1997

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

Growth in the metal industry leading indexes is slowing because some indicators are beginning to reflect the poor outlook for East Asian economies. Declines in stock price indexes, metal prices, and the October level of new orders for nonferrous metals are responsible for most of the lower growth in the leading indexes. The metals price leading index fell for the first time in 5 months in October, the latest month for which it is available, because of a sharp drop in new orders for nonferrous metals.

The **primary metals leading index** dropped 1.2% in November to 125.5 from a revised 127.0 in October. The index's 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, slipped to 2.2% from a revised 5.3% in October.

Three of the four available index components, the S&P stock price index for diversified machinery, the Purchasing Managers' Index, and the growth rate of the Journal of Commerce metals price index, moved down in November. The length of the average workweek in primary metals establishments was the only index component to increase.

Because only four of eight index components were available, the November primary metals leading index should be considered preliminary. Although the November drop in the leading index may be reduced next month, its growth rate will likely continue to reflect a slowing from last summer's rates because of anticipated slowing growth in the other indicators. The leading index therefore suggests that growth in the U.S. primary metals industry may slow in the months ahead. Growth in the primary metals coincident index, which measures current activity, has consistently been in the 3.0% to 4.0% range over the past year.

The **steel leading index** was almost unchanged in October, moving to 106.9 from a revised 106.8 in September, while the index's 6-month smoothed growth rate eased to 5.5% from a revised 6.1% in September. All but one of the index's nine components barely increased or were flat in October. The only exception was the S&P stock price index for steel companies, which experienced its largest 1-month drop since August 1995. The leading index points to slow growth in the domestic steel industry in the near term.

The **aluminum mill products leading index** was the only leading index to show any growth in October. It rose 1.0% to 148.2 from

a revised 146.7 in September and its 6-month smoothed growth rate moved up to 7.5% from a revised 6.2% in September. Half of the net increase in the index was caused by a 0.8 hour increase in average weekly hours worked in aluminum, sheet, plate, and foil establishments. The aluminum mill products leading index continues to point to moderate growth in the U.S. aluminum mill products industry into early 1998.

The **primary and secondary aluminum leading index** moved down 0.4% to 246.3 from a revised 247.2 in September. The index's 6-month smoothed growth rate slowed to 7.6% from 9.7% in September. A decline in deflated new orders for nonferrous and other primary metals made the largest negative contribution to the leading index. However, this leading index still indicates healthy U.S. demand for primary aluminum over the coming months. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

The **copper leading index** fell 1.3% in October to 121.8 from 123.4 in September. The index's 6-month smoothed growth rate slowed to 0.1%, down from a revised 3.2% in September. Deflated new orders for U.S. nonferrous metals and the ratio of shipments to inventories for electronic and other electrical equipment were responsible for most of the decrease in the leading index. The copper leading index is signaling flat-to-slow near-term growth in the U.S. copper industry.

Metals Price Leading Index Moves Lower

A sharp drop in the growth rate of deflated new orders for U.S. nonferrous metals pulled the metals price leading index lower in October. The index fell 1.3% to 97.8 from a revised 99.1 in

September and its 6-month smoothed growth rate moved down to 2.7% from a revised 6.1%. The growth rate of building permits for new housing units made a modest positive contribution as that component was at the highest rate since April 1996. The third available component, the growth rate for the deflated M2 money supply, was unchanged in October. The only other index component, the growth rate of the Organization for Economic Cooperation and Development total leading index, moved up in September, the latest month for which it is available. Its growth rate is 6.4%, the highest since April 1994.

The growth rate of the deflated value of nonferrous metal products inventories held in the United States rose to 6.6% in October, the highest growth rate in a year. This growth rate, a measure of changes in the supply of nonferrous metal products in the United

States, partially explains why metal price growth has declined in recent months.

Normally, the metals price leading index, a measure of possible future demand for metals, leads significant changes in price growth by about 7 months. Growth in the MII Nonferrous Metals Price Index, however, has been declining since last May because of growing inventories and the declines have accelerated because of fears about the Asian economic crisis. At this time, inventory levels and uncertainty about the economic situation in East Asia appear to be better indicators of the direction of metal prices than the metals price leading index. As such, prices may remain under downward pressure for the near term. It should be remembered that the business cycle and inventories are only two factors that affect metal prices. Other factors include changes in metals production, speculation, strategic stockpiling, and production costs.

An explanation of the indexes and the 6-month smoothed growth rates appears on page 12.

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

	Leading Index of Metal Prices (1967=100)	Six-Month Smoothed Growth Rates				
		MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
1996						
October	94.4	-21.1	9.2	-16.6	-31.7	-13.3
November	94.8r	2.1	6.3	-2.8	11.8	-26.3
December	95.0r	-6.9	5.3	-2.0	-11.2	-21.8
1997						
January	95.8r	6.5	-0.2	9.8	6.6	-6.6
February	96.5r	11.0	-0.9	12.7	10.5	3.7
March	96.7r	10.4	-3.7	10.1	11.2	-3.3
April	96.4r	9.7	-3.7	10.8	12.2	-8.5
May	96.1r	18.4	-5.1	11.0	30.7	2.0
June	96.2r	15.1	-3.3r	5.1	25.8	3.4
July	97.0r	16.2	2.6	21.0	3.4	11.6
August	98.0r	4.8	3.1r	4.6	-12.5	13.6
September	99.1r	1.3	3.3r	9.3	-15.9	4.6
October	97.8	-8.5	6.6	3.6	-25.3	6.7
November	NA	-16.8	NA	-1.9	-35.9	13.8
<i>r - Revised</i>						
Note:	The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.					
Sources:	U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).					

Link To:

Chart 1.

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
December	121.0	2.7	109.0	3.5
1997				
January	121.1	2.5	109.1	3.0
February	122.3	3.9	109.7	3.5
March	123.3	5.0	109.9	3.3
April	123.8	5.2	110.5	3.7
May	124.9	6.4	110.4	3.1
June	125.2	6.1	110.8r	3.2r
July	126.0r	6.7r	110.9r	2.9r
August	127.1	7.6r	111.6r	3.5r
September	127.0r	6.5r	112.0r	3.7r
October	127.0r	5.3r	112.5	3.9
November	125.5	2.2	NA	NA

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

Leading Index		October	November
1. Average weekly hours, primary metals (SIC 33)		0.2r	0.4
2. S&P stock price index, machinery, diversified		0.1r	-1.1
3. Ratio of price to unit labor cost (SIC 33)		-0.2	NA
4. JOC metals price index growth rate		-0.1r	-0.1
5. New orders, primary metals, (SIC 33) 1982\$		-0.4	NA
6. Index of new private housing units authorized by permit		0.1	NA
7. Growth rate of U.S. M2 money supply, 1992\$		0.0	NA
8. Purchasing Managers' Index		0.2r	-0.3
Trend adjustment		0.0	0.0
Percent change (except for rounding differences)		-0.1r	-1.1
Coincident Index		September	October
1. Industrial production index, primary metals (SIC 33)		0.1r	0.0
2. Total employee hours, primary metals (SIC 33)		-0.1	0.3
3. Value of shipments, primary metals, (SIC 33) 1982\$		0.2	0.0
Trend adjustment		0.1	0.1
Percent change (except for rounding differences)		0.3r	0.4

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA: Not available r - Revised

Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

Links To:

Chart 2.

Chart 3.

Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
November	101.8	-1.3	98.2	0.3
December	102.5	0.1	98.7	1.1
1997				
January	102.9	0.8	99.3	2.1
February	103.6	2.0	99.0	1.2
March	104.1	2.9	99.2	1.4
April	103.9	2.2	99.6	1.9
May	104.0	2.3	99.6	1.4
June	104.6	3.3	99.5	1.2r
July	104.5	2.9	99.6	1.0
August	106.1r	5.6	99.8	1.4
September	106.8r	6.1r	100.4r	2.4r
October	106.9	5.5	100.3	1.8

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 5.
The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

Leading Index	September	October
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	-0.1r	0.1
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982\$, (SIC 331)	0.2r	0.0
3. Shipments of household appliances, 1982\$	0.5	0.0
4. S&P stock price index, steel companies	0.0	-0.4
5. Industrial production index for automotive products	0.1	0.1
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	-0.1	0.0
7. Index of new private housing units authorized by permit	0.2	0.1
8. Growth rate of U.S. M2 money supply, 1992\$	0.1	0.0
9. Purchasing Managers' Index	-0.3	0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.6r	0.1
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	0.3	-0.1
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982\$	0.1	0.0
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	0.2r	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.7r	-0.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

NA: Not available r - Revised

Links To:

Chart 4.

Chart 5.

Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
November	139.3	1.4	124.5	2.6
December	140.1	2.5	124.5	2.3
1997				
January	141.0	3.4	123.0	-0.4
February	143.0	5.5	125.5	2.9
March	143.0	4.8	126.8	4.5
April	143.7	4.9	125.4	1.9
May	143.8	4.5	125.2	1.3
June	143.6	3.8	126.8	3.5
July	144.0r	3.9r	126.9r	3.0r
August	144.5r	4.0	126.8r	2.3r
September	146.7r	6.2r	127.5r	3.1r
October	148.2	7.5	127.7	3.2

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 7.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index	September	October
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	0.2r	0.5
2. Index of new private housing units authorized by permit	0.2	0.1
3. Industrial production index for automotive products	0.1	0.1
4. Construction contracts, commercial and industrial (square feet)	0.8	0.1
5. Net new orders for aluminum mill products (pounds)	0.2	-0.1
6. Growth rate of U.S. M2 money supply, 1992\$	0.1	0.0
7. Purchasing Managers' Index	-0.3	0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	1.4r	1.0
Coincident Index		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	0.1	-0.2
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	0.0	0.3
3. Shipments of aluminum mill products (pounds)	0.4	-0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.6r	0.1

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

NA: Not Available r - Revised

Links To:

Chart 6.

Chart 7.

Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
1996				
November	121.0	3.9	113.3	1.0
December	120.2	2.1	114.3	2.5
1997				
January	120.2	1.9	113.8	1.4
February	122.0	4.2	114.1	1.7
March	123.5	6.1	113.7	0.8
April	121.8	2.7	114.2	1.3
May	122.7	3.9	113.5	0.1
June	122.8	3.7r	113.9	0.5
July	121.7	1.4	113.4r	-0.6r
August	122.3	1.9	114.1	0.7r
September	123.4	3.2r	115.1r	1.9r
October	121.8	0.1	115.1	1.8

r - Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	September	October
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	0.1	0.0
2. New orders, nonferrous and other primary metals, 1982\$	0.3	-0.7
3. MII stock price index, copper companies	-0.3	0.0
4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	0.6	-0.5
5. Growth rate of the LME spot price of primary copper	-0.1	-0.2
6. Index of new private housing units authorized by permit	0.3	0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.9	-1.3
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.0	-0.3
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	0.3r	0.2
3. Copper refiners' shipments (short tons)	0.5	0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.9r	0.1

Sources: Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3 and 5 of the leading index.

NA: Not available r - Revised

Links To:

Chart 8.

Chart 9.

Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930's. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.¹

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

Three of the metal industry coincident indexes, those for primary metals, steel, and aluminum mill products, reflect their classifications in the U.S. Standard Industrial Classification (SIC). The SIC is the main classification used by the United States government and industry in collecting and tabulating economic statistics. Two of the coincident indexes, one for copper and one for primary and secondary aluminum, are blends of two different copper and aluminum industries, respectively.

Of the five metal industries, primary metals is the broadest, consisting of twenty-six different metal processing industries. The steel, aluminum, and copper industries are parts of the primary metals industry.

The metal industry leading indexes turn before their respective coincident indexes an average of 9 months for primary metals, 8 months for steel, and 7 months for copper. The average lead time for the leading indexes of aluminum mill products and primary and secondary aluminum is 6 months.

¹**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

The leading index of metal prices, also published in the Metal Industry Indicators, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 7 months in advance.

The growth rate used in the Metal Industry Indicators is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[\left(\frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EST, Friday, January 23. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for Metal Industry Indicators on the World Wide Web is: <http://minerals.er.usgs.gov/minerals/pubs/mii/>

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